

10. On the Question of the Identity of Species of the Common Domestic and the Chinese Goose. By F. B. GOODACRE, M.D., F.Z.S.

[Received September 16, 1879.]

Having read long ago, in 'The Origin of Species' (p. 275), about the fertility *inter se* of "hybrids" between the Common Domestic and Chinese Geese, I was induced, when the opportunity occurred some few years ago, to commence a series of experiments to verify this alleged fertility, several gentlemen very kindly consenting to assist me in the investigation. The following crosses have been obtained by one or another of us, and some of them in more than one case:—Chinese ♂ with Common ♀ produced several Goslings; a pair of these, out of the same nest, have produced young last year and again this; half-bred ♂ with both Common ♀ and Chinese ♀; one quarter Chinese and three quarters Common ♂ with both Common ♀ and Chinese ♀.

The number of the Goslings in proportion to that of the eggs has been small in many, but not in all cases, and is, I think, to be attributed to some accident in our arrangements, and not to any lurking sterility between the two forms. In fact I suspect the two forms themselves, and cross-bred birds of them in any proportions, to be quite as fertile *inter se* as either of the pure forms by itself.

Now the chief interest in the results of these experiments seems to be that half-bred birds of the same nest produced young; for, as a consequence of their doing so, we seem compelled to believe one of two things, either that hybrid birds can be fertile *inter se*, or that the half-bred birds above mentioned were not hybrids at all, but only mongrels; in other words, that the two forms of Domestic Goose are specifically identical. Most naturalists have hitherto considered them specifically distinct; it is certain they either are or are not; and how is the case to be decided? The declaration of the most learned naturalists either way cannot settle the point, nor do I see any way of doing so beyond all doubt if we give up that rule, so generally received, that hybrids are infertile *inter se*, and, of course, we cannot quote that rule as a *proof* against an apparent exception to itself. Yet the fertility of these cross-bred birds may be taken as *good presumptive evidence* in favour of identity of species in their parent forms, and is quite sufficient to make us inquire more curiously into the matter, to see what other evidence can be found to incline us to believe in such identity. The advocates of their non-identity would very naturally call our attention to the great difference between them as to general form, colour, and voice, to the peculiar knob on the Chinese bird's head, and to its prolonged season of incubation. The existence of the last of these differences (except in books) I have good reason to deny; the other differences must be admitted, and something said with reference to each to show

that they do not absolutely render identity of species improbable. Great as may be the difference of general form, is it greater than that between a Carrier and a Tumbler Pigeon, or between a Greyhound and a Pug among Dogs? As to voice, the Call Duck, Trumpeter Pigeon, and Common Dog all afford instances of modification of voice in a greater or less degree, from the normal voice of the Wild Duck and Rock-Dove in the first two cases, while the bark of the Dog is said to be a domestic accomplishment altogether, but is never supposed to divide Dogs into two species, those that bark and those that cannot; for the young of the latter learn to bark in this country. As to colour, it should be borne in mind that sandy-coloured Geese are not infrequent in some parts. The stripe down the back of the neck of the Chinese Goose is a very distinctive marking; but it may well be asked if it is necessarily of greater value as a specific distinction than the spinal stripe in certain Horses, especially those of a dun colour. The knob on the base of the bill of the Chinese bird is doubtless the greatest distinguishing mark between the two forms.

In the opinion of most naturalists, the Grey-lag Goose is the wild original of our common domestic bird; and from Yarrell we learn that its range extends to China and Japan. The same author also points out its clear grey shoulder as a characteristic of the Grey-lag, distinguishing it from the most nearly allied British wild Geese; and, curiously enough, this is very evident in the Chinese bird. The trachea of the male in most Swans, Geese, Ducks, and Mergansers is a most trustworthy guide as to specific difference: but in the case under consideration it appears to be of little use; for there is good ground for suspecting that the form of the trachea in the Grey-lag is not constant. Yarrell says:—"In the wild Grey-legged Goose the tube of the windpipe is nearly cylindrical; and this form of trachea I have frequently found on examination of domestic Geese intended for the table; but I have frequently also found the tube flattened at the lower portion" (Yarrell's Brit. Birds, vol. iii. p. 55). The tracheæ of two Chinese Ganders which I have myself examined were very slightly swelled and flattened at the lower portion. I have not had the opportunity yet of examining that of a Chinese Goose; the windpipes taken from cross-bred birds condemned for the kitchen, without regard to sex, have all had a very decided swelling and flattening of the lower portion of the tube. In Chinese Geese there is generally a small rim of white feathers at the base of the bill; and a broader band is far from uncommon in the ordinary Domestic Goose. This and the swelled and flattened trachea have been rightly looked upon as analogous variations; but perhaps the cause of their occurrence has been too readily accounted for by Yarrell and others by supposing an admixture of blood from the "White-faced Goose" in the building-up of the domestic form in remote times. May it not be that there is a tendency in the Grey-lag to vary in these directions, and that hence such a tendency reveals itself also in the Chinese form?

It may, I know, be asked, If the Chinese form was modified out

of the Grey-lag, how came there to be wild Chinese birds? To which it may be replied, Is it certain that there are any? may not the supposed wild specimens be only feral? If so, it would be a somewhat similar case to feral "chequered" Rock-Doves, as far as regards breeding for generations without reverting to the original type.

The fertility between these two forms of Domestic Geese reminds me forcibly of the same thing between divers so-called species of wild Pheasants, as shown by Mr. Tegetmeier; and I am inclined to accept his solution of the mystery as applicable to Geese also.

Of course I do not pretend to be able to *prove* the specific identity of the Common and the Chinese Goose; but I think what I have said may be taken as evidence that such a theory is really not so absurd as it may at first sight appear to be.

The doctrine of specific identity of certain very diverse forms of animals appears to me one deserving of careful study; and every case that may be supposed to illustrate it in a marked way seems of importance towards attaining what we ought all to be seeking—the truth. Hence the fertility of the offspring of Common and Chinese Geese may teach us lessons of general interest and importance in zoology.

Great variations of a species are chiefly to be observed in domestic animals; but we err if we suppose they do not occur among wild ones, although doubtless many are masked from our observation by their receiving specific names when in reality they are nothing more than varieties or geographical races.

In conclusion I will briefly state that there are three points, in the cross-bred Geese themselves which we have been considering, which incline me to look on them as mongrels. According to the laws of hybridity one would have expected the trachea to be intermediate between the parent forms (as it is in hybrids of the Musk-Drake with the Common Duck), and the knob on the bill and the stripe on the neck to be quite suppressed; now none of these things happen.

I shall be glad to hear that any zoologist is willing to turn his attention towards solving the mystery that certain so-called hybrids produce fertile offspring (which most do not); for this seems always to happen in cases in which the right to specific distinction is questioned by some naturalists.

Wilby Rectory, Norfolk,  
September 1879.

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